Kagan 604812 (ORE); 3 Jun 1982, *Crosby 2651* (CUHK, OSC); 11 Jul 1983, *But 83-2* (A, CUHK, IBSC, K, UC, US).

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Notes on *Betula* ser. *Humiles* (Betulaceae) in Idaho.—The shrubby members of the genus *Betula* (series *Humiles*) have long been a source of taxonomic uncertainty and debate. Members of this group from the Pacific Northwest have been treated variously as four species, two varieties of a single species, or two species. Butler (Bull. Torr. Bot. Club 36:421–440. 1909) recognized four species from the region: *B. glandulosa* Michx., *B. glandulifera* (*B. pumila* L. var. *glandulifera* Regel—references cited below), *B. hallii* Howell, and *B. crenata* Rydb.; the latter known only from the type locality in western Montana. Hitchcock (*in* Vascular Plants of the Pacific Northwest, Pt. 2, Univ. Wash. Press, Seattle. 1964) included all of the variation in the region under two varieties of *B. glandulosa* (var. *glandulosa* mostly from east of the Cascades, and var. *hallii* from the Cascades and west). He noted, however, that occasional specimens from Idaho, Montana, eastern Washington, and Wyoming represented perhaps a third variety. More recent workers have recognized the presence of both *B. glandulosa* and *B. pumila* var. *glandulifera* in various portions of the northern Rocky Mountains (Brayshaw, Catkin bearing plants of British Columbia. 1976; Scoggan, Flora of Canada. 1978; Moss, Flora of Alberta, 2nd ed. 1983; Dugle, Can. J. Bot. 44:929–1007. 1966, who recognized *B. glandulifera*). The identity of many Idaho specimens, however, has remained uncertain.

Betula pumila var. *glandulifera* is recognized generally by its broad samara wings (>½ as broad as the body), obovate leaves with more than 10 teeth on each side, and stature up to 4 m. *Betula pumila* is tetraploid, $2n = 56$ (Woodworth, Bot. Gaz. 90:108–115. 1930).

In contrast, *B. glandulosa* has narrow samara wings (<½ as broad as the body), broadly ovate to orbicular leaves with less than 10 teeth on each side, and is generally less than 2 m tall. *Betula glandulosa* is diploid, $2n = 28$ (Packer, Can. J. Bot. 42: 473–494. 1964).

In 1982, we discovered 5 populations of birch in extreme northern Idaho that match closely the published descriptions of *B. pumila* var. *glandulifera* (as summarized above). Two representative localities are: Boundary Co., swamp/fen at nw. end of Bonner Lake, 15 km ene. of Bonners Ferry, T62N R3E S18, 760 m, 31 Jul 1982, *Johnson and Brunsfeld 1962* (ID, IDF, V); swamp/fen on e. shore of Perkins Lake, 18 km ene. of Bonners Ferry, T62N R3E S5, 800 m, 29 Oct 1982, *Brunsfeld 2009* (ID, IDF, V). The identification of both of these collections was verified by T. C. Brayshaw (V). This is the first report of this species in Idaho.

For further confirmation of this identification, we germinated seed and made mitotic chromosome counts of root tip cells following procedures outlined by Soltis (Syst. Bot. 5:17–19. 1980). Two counts were obtained from populations in Boundary Co.: 1) $2n = 56$, Perkins Lake, *Brunsfeld 2009*; 2) $2n =$ ca. 56, Skin Cr., 2.5 km n. of Perkins Lake, *Brunsfeld 2015* (ID, IDF). Camera lucida drawings and photomicrographs are on file with the authors. These counts are the first reported for *B. pumila*

from western North America. These data and morphological evidence support the identification of these plants as *B. pumila* var. *glandulifera.*

Examination of herbarium specimens (ID, IDF, OSC, ORE, WS, WTU) revealed the presence of two additional major forms of shrubby birch in Idaho. *Betula glandulosa,* as delineated above, and as recognized by Hitchcock (op. cit., var. *glandulosa*), Dugle (op. cit.), and Brayshaw (op. cit.), occurs throughout east-central and southeastern Idaho. Throughout the rest of central and northern Idaho, excluding the small northeastern corner that contains *B. pumila,* a form occurs with characteristics of both *B. pumila* and *B. glandulosa.* Two collections of this material, *Wellner 1388* (ID, IDF, V) and *Johnson 4984* (IDF, V), were confirmed as intermediate by T. C. Brayshaw. About half of the collections we examined of series *Humiles* in Idaho can be placed in this category. This form appears to be what Hitchcock (op. cit.) considered a possible new variety of *B. glandulosa.* In 1960 he annotated an Idaho specimen (*Daubenmire 5299,* WS) of this kind as follows: "Atypical (*B. glandulosa*), perhaps representative of a Rocky Mtn. race." Dugle (op. cit.) studied plants with similar morphology in western Canada and concluded that they were hybrids between *B. glandulosa* and *B. glandulifera* (*B. pumila*). A range in chromosome numbers of $2n = 28–56$ was reported in the apparent hybrids. Dugle named the hybrid *B.* ×*sargentii* Dugle and reported it as a "very important member of the flora in western Alberta."

This study reveals that *Betula* series *Humiles* in Idaho is represented by *B. pumila* in the far-northern part of the state, by *B. glandulosa* in east-central and southeast Idaho, and by an apparently intermediate form in the area between these two species. It appears likely that the intermediate is *B.* ×*sargentii,* reported from western Canada. By this note we hope to encourage additional biosystematic work on this group.

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Salix lanata SUBSP. *calcicola* IN COLORADO.—*Salix lanata* L., an essentially Arctic circumpolar species, occurs in the Colorado alpine as the subspecies *calcicola* (Fern. & Wieg.) Hulten. The following collection represents the first occurrence for Colorado and the contiguous United States, ca. 1600 km sse. of the nearest populations in Banff National Park, Alberta, and 2250 km sw. of the periphery of its main range along the west coast of Hudson Bay: COLORADO, PARK CO., Horseshoe Cirque, Mosquito Range, 5 mi above 4-Mile Campground, sw. of Fairplay, 3650 m, 23 Jul 1984, *W. A. Weber and D. Randolph 17395* (CAN, COLO), determined by George Argus.

This eastern Canadian low-Arctic subspecies is distributed around the shores of Hudson and Ungava bays, and coasts of northern Labrador, southern Baffin Island, and eastern District of Keewatin. Disjunct populations occur in western Newfoundland, the Gaspe Peninsula, and western Alberta. Its distributional pattern parallels that of *S. vestita* Pursh, another calciphile with its main population in eastern Canada and disjunct populations in the western cordillera (Miller and Thompson, J. Arnold Arb. 60:167–218. 1979). The closely related *S. tweedyi* (Bebb) Ball also occurs in the western United States. Both of these taxa have large, precociously flowering, sessile aments that are usually borne at the ends of branches. Their capsules are